

Figure 1 Simple implementation of the ultrasonic loudspeaker

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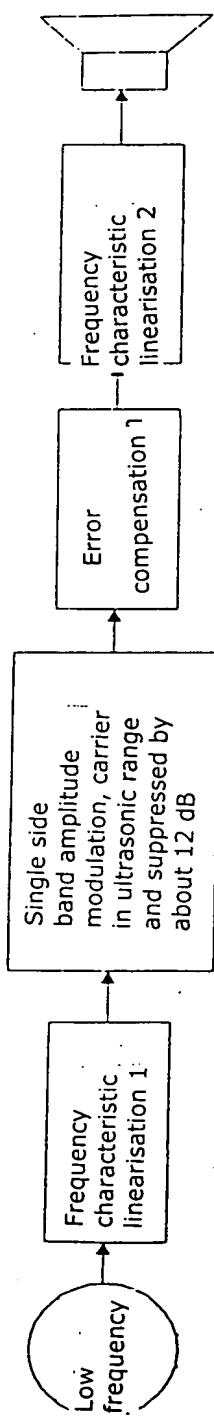


Figure 2 Improved circuit of the ultrasonic loudspeaker

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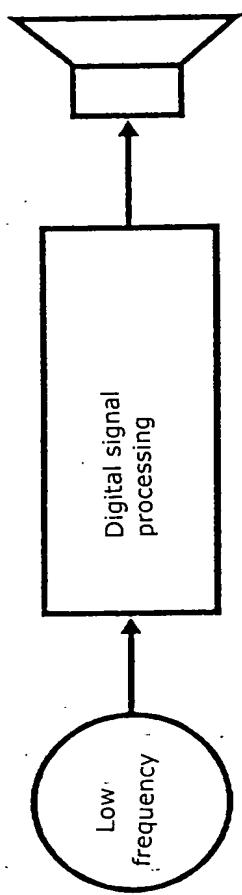
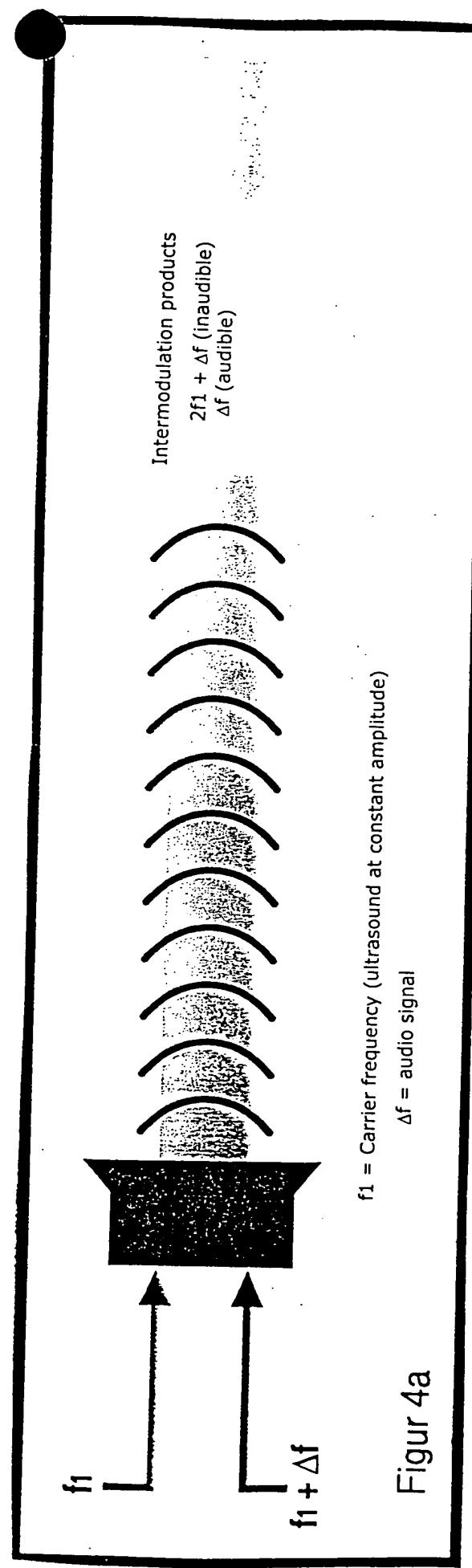


Figure 3 Transmission path embodied with digital signal processing (DSP)

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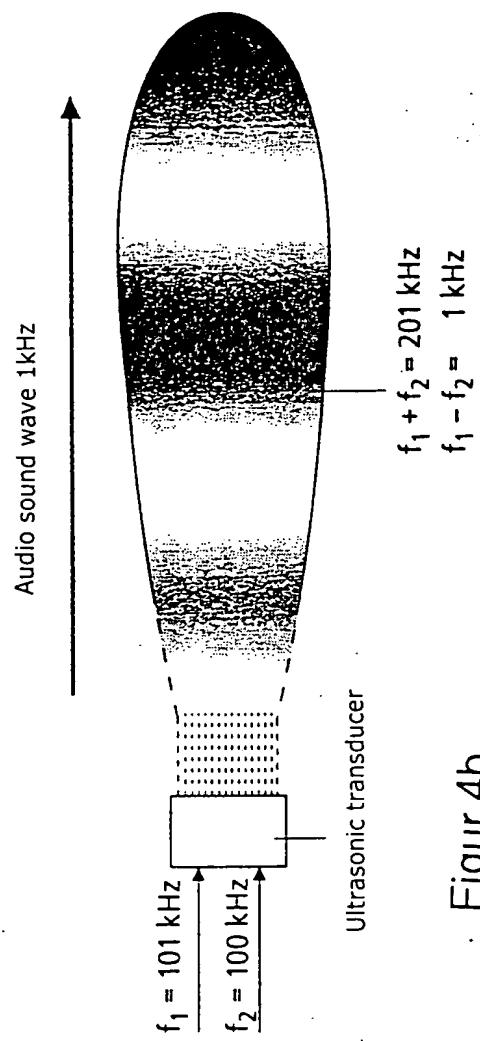


$f_1$  = Carrier frequency (ultrasound at constant amplitude)

$\Delta f$  = audio signal

Figur 4a

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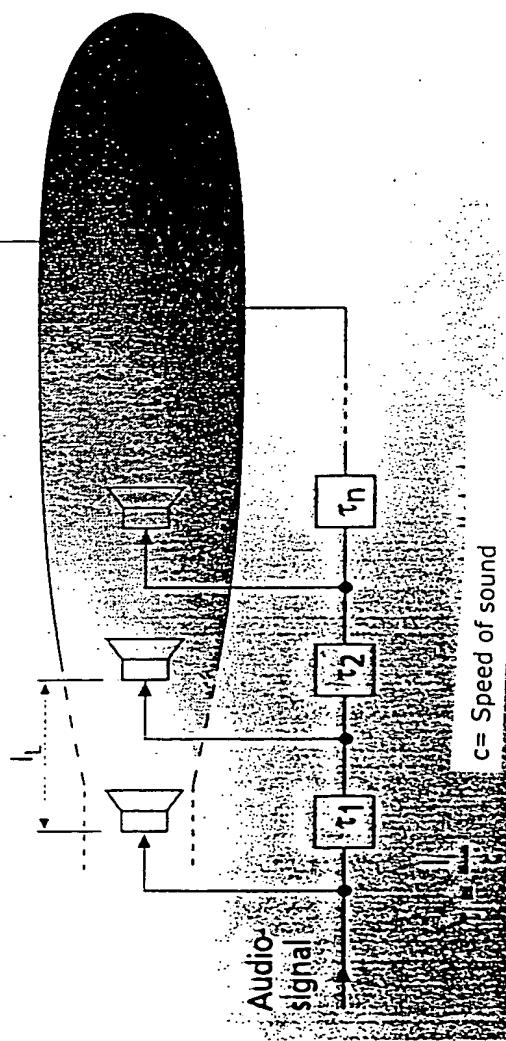


Figur 4b

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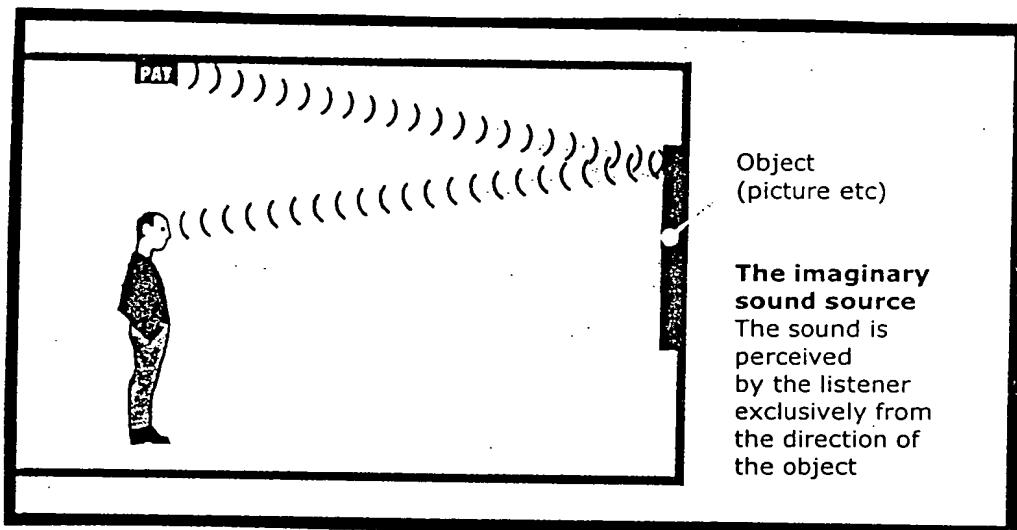
DATA FONTS

Resultant directional characteristic



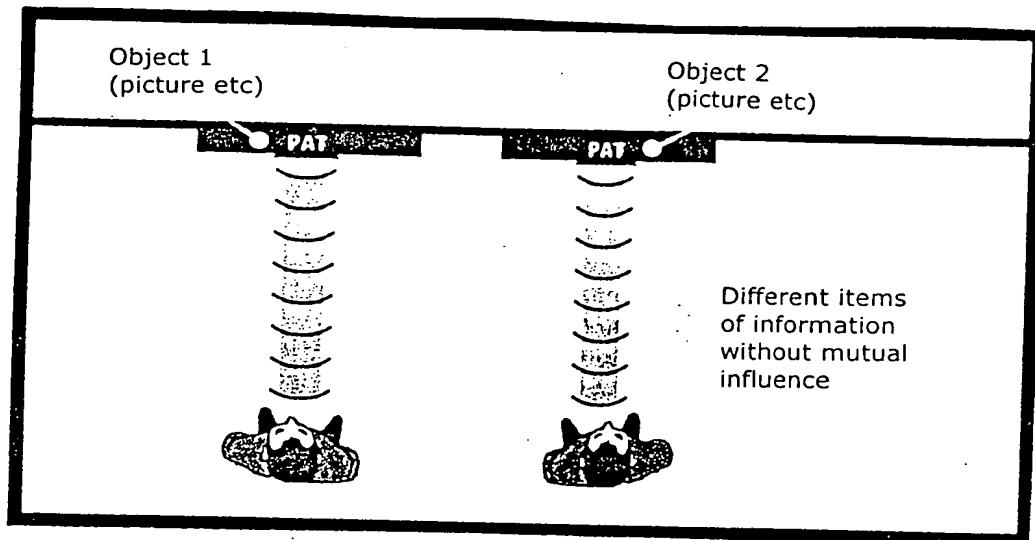
Figur 5

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Figur 6a

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Figur 6b